Applicants have amended Claim 22 to correct the obvious typographical error. Claim 22 now reads "...has a dielectric constant of less than 3.9." Accordingly, Applicants submit that the rejection for indefiniteness is overcome.

Rejections under 35 U.S.C. § 102(a)

The Examiner has rejected Claims 21, 22 and 24 under 35 U.S.C. § 102(a) as being anticipated by Anjum et al. (U.S. Patent No. 5,372,951).

The Examiner asserts that Anjum et al. taught isolation regions defined by a trench within the substrate. The Examiner is mistaken. Anjum et al. taught a LOCOS (local oxidation of silicon) for field oxide isolation; they did not teach trench isolation (Figures 3-5). LOCOS involves thermal oxidation of exposed silicon in isolation regions.

Independent Claim 21 recites forming a trench with "a characteristic profile produced by an etch process." The Examiner dismisses this limitation without consideration, stating that "it is non-limiting, because only the final product is relevant, not the method of making. A product by process claim is directed to the product per se, no matter how actually made."

The Examiner has provided no support for the proposition that product-by-process limitations can be ignored. The principles of laws cited by the Examiner stand only for the proposition that a product-by-process claim is a product claim, not a process claim. Applicants refer the Examiner to *In re* Garnero, 162 U.S.P.Q. 221, 223 (CCPA 1969), where it was held that a process phrase in a product claim is a structural limitation. There is no support for simply ***ignoring*** the limitation.

In reality, Applicants recite a particular ***structure***, namely, a "characteristic profile." The Examiner has not shown that Anjum et al. has a profile that an etch process could produce. Trench isolation involves etching of trenches in isolation areas and filling with insulating material. One of ordinary skill in the art understands the difference between LOCOS isolation as taught by Anjum et al. and trench isolation as recited in independent Claim 21. The skilled artisan would not use the term "trench" to describe the configuration of the oxide isolation structure taught by Anjum et al., much less the term "trench having a characteristic profile produced by an etch process."

Applicants respectfully traverse the rejections and submit that Anjum et al. failed to teach each and every feature of independent Claim 21.

Dependent Claims 22 and 24 each depend from independent Claim 21 and therefore include all the features and limitations thereof. Furthermore, the dependent claims add further distinguishing features of particular utility. Accordingly, Applicants submit that the dependent claims are also allowable over Anjum et al.

Rejections under 35 U.S.C. § 103(a)

The Examiner has rejected Claims 11-16 and 23 under U.S.C. § 103(a) as being unpatentable over Bose (U.S. Patent No. 5,492,858) in view of Anjum et al. (U.S. Patent No. 5,372,951).

In independent Claim 11, Applicants recite an isolation structure in a semiconductor substrate comprising a recessed portion formed with vertical sidewalls within the semiconductor substrate and a dielectric material comprising a halide-doped silicon oxide filling the recessed portion.

Bose et al. taught a process for forming trench isolation structures filled with a ***deposited undoped dielectric material***, preferably silicon oxide (Col. 6, lines 23-29 and 63).

Anjum et al. taught a LOCOS isolation structure wherein the ***thermally-grown oxide*** was thickened by doping the oxide with an impurity species that included fluorine (Col. 3, lines 9-13).

The Examiner has not provided a suggestion to combine these references from the prior art.

The skilled artisan would not have been motivated to employ the trench structure of Bose et al. with the thermally-grown, fluorine-doped oxide of Anjum et al., as they involve two completely different processing techniques and resulting structures. The motivation to use fluorine, as taught by Anjum et al., is to thicken thermally-grown oxide in small areas, which normally grow at a slower rate than in larger areas (Col 2, lines 58-63). The thin oxides will oxidize further into the substrate as a result of fluorine mobility in order to bring their thickness up to and substantially equal to thicker oxides of larger area (Col. 3, lines 29-32). The implanted fluorine dislodges oxygen from the oxide bulk. The dislodged oxygen recombines with silicon at the juncture between the oxide and the substrate to form silicon dioxide bonds therein (Col 3, lines 9-13). This thickening effect occurs predominantly in small oxide areas. This incorporation of fluorine is specifically designed for the thermal oxide growth process as taught by Anjum et al.

This rationale is not applicable to depositing oxides as taught by Bose et al. The Examiner has provided no reason ***from the prior art*** that the skilled artisan would have combined the teachings in the manner of the rejections.

"Before the PTO may combine the disclosures of two or more prior art references in order to establish *prima facie* obviousness, there must be some suggestion for doing so, found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art." *In re* Jones, 21 U.S.P.Q.2d 1941, 1943-44 (Fed. Cir. 1992).

Accordingly, Applicants respectfully traverse the rejections and submit that the pending claims are patentably distinct over the art of record.

CONCLUSIONS

In view of the foregoing amendments and remarks, Applicants submit that the application is in condition for allowance. If, however, some issue remains which the Examiner feels may be addressed by Examiner's amendment, the Examiner is cordially invited to call the undersigned for authorization.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is titled **"Version with markings to show changes made."**

Respectfully submitted,
KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: March 19, 2001

By: _____

Adeel S. Akhtar
Registration No. 41,394
Attorney of Record
620 Newport Center Drive, Sixteenth Floor
Newport Beach, CA 92660
(415) 954-4114

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

22. (Amended) The integrated circuit of Claim 21, wherein the halide-doped silicon oxide has a dielectric constant of ~~greater~~ less than 3.9.

W:\DOCS\RPC\RPC-1127.DOC
031901